Why do over-deviated firms from target leverage undertake foreign acquisitions?

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Abstract

This paper examines how deviation from firms' target leverage influences their decisions on undertaking foreign acquisitions. Using a sample of 5,746 completed bids by UK acquirers from 1987 to 2012, we observe that over-deviated firms are more likely to acquire foreign targets. Consistent with co-insurance theory, we find that over-deviated firms engage in foreign acquisition deals to relieve their financial constraints and to mitigate their financial distress risk. We also note that foreign acquisitions enhance over-deviated firms' value and performance, measured by Tobin's q and return on assets (ROA) respectively. These findings support the view that over-deviated firms pursue the most value-enhancing acquisitions. Overall, this paper suggests that co-insurance effects, value creation and performance improvements are the main incentives for over-deviated firms' involvement in foreign acquisitions.

Keywords: Leverage deviation, Co-insurance theory, Global diversification, Financial constraints, Default risk, Firm value, Operating performance.

JEL classification: G14, G30, G32, G34

1. Introduction

The connection between leverage deviation as a source of new finance and subsequent mergers and acquisitions (M&A) decisions is assumed, but few studies have investigated this link (e.g. Harford, Klasa, & Walcott, 2009). Uysal (2011) argues that leverage deviation- defined as the difference between actual and target leverage- is the main motive of undertaking an acquisition. Specifically, firms with a leverage level above their target (henceforth "over-deviated firms") are exposed to higher financial distress risk and greater financial constraints, which impede their ability to make a domestic acquisition (Kayhan & Titman, 2007; Dang, Kim, & Shin, 2012; Uysal, 2011). Harford et al. (2009) confirm that financial constraints of over-deviated firms reduce propensity of financing large acquisitions with cash. Morellec and Zhdanov (2008) find that high financial distress costs of issuing new debt by over-deviated firms impede their abilities to win takeover bidding contests. Accordingly, this paper extends the literature by examining whether a particular type of acquisition may help over-deviated firms to relief the drawbacks of holding debt higher than target, which would otherwise create both a higher risk of default and increased financial constraints.

According to co-insurance theory, global diversification through foreign acquisitions may induce uncorrelated cash-flow streams arising from operating in different countries (Lewellen, 1971). These stable cash flows may minimise firms' earnings volatility, which, in turn, reduce their financial distress risk and financial constraints (Higgins & Schall, 1975). Hann et al. (2013) confirm that the co-insurance effect of diversification mitigates firms both default and systematic risk. Baker, Foley and Wurgler (2009) show that foreign acquisitions can ease the financial constraints of acquirers through the availability of cheap financial capital channels. Thus, motivated by co-insurance theory, this paper extends Uysal's (2011) paper by exploring whether over-deviated firms may undertake foreign acquisitions in order to reduce their default risk and ease their financial constraints. It also addresses the economic effect of foreign acquisitions on the value and performance of over-deviated firms.

This paper focuses exclusively on global diversification through foreign acquisitions rather than on industrial diversification for several reasons. First, Dos Santos, Errunza and Miller (2008) suggest that it is hard to measure industrial diversification, whereas foreign acquisitions provide a clear channel for measuring global diversification.[1] Second, Heston and Rouwenhorst (1994) find that global diversification is a more efficient tool for risk reduction than industrial diversification. They argue that country-specific factors, such as monetary and fiscal policies, institutional regimes, legal regimes and regional economic shocks, reduce cash-flow volatility more effectively than industrial diversification within a single country. Previous studies (e.g. Baker et al., 2009; Francis, Hasan & Sun, 2008) have confirmed the superior effect of global diversification in relaxing firms' financial constraints. Third, global diversification provides both financial and real benefits, while industrial diversification affords only real benefits (Errunza & Senbet, 1984; Morck & Yeung, 1992; Barney, 1991).[2] The financial benefits of global diversification enhance firms' value beyond value-destroying industrial diversification decisions (Gande, Schenzler & Senbet, 2009; Dos Santos et al., 2008). Accordingly, consistent with Uysal (2011), we expect that over-deviated firms that already have high risk exposure will be more selective and choose value-enhancing global diversification.[3]

This paper also investigates what are the drivers and outcomes of foreign acquisitions by over-deviated firms in the UK context for the following reasons. First, The UK has become a leading player in foreign acquisitions markets.[4] By 2000, foreign acquisitions by UK firms

[1] Dos Santos et al. (2008) show that using industrial segment reporting or Standard Industrial Classification (SIC) to measure industrial diversification is subjective. For example, Graham, Lemmon and Wolf (2002) find that only 16 per cent of qualified firms change their business segment reporting subsequent to M&A deals.

[2] Financial benefits of foreign acquisitions may include offering shareholders international diversification opportunities that enhance their stock price compared to stand-alone counterparts (Errunza & Senbet, 1984). However, real benefits of foreign acquisition may include combining acquirers' and targets' information-based intangible assets (Morck & Yeung, 1992; Barney, 1991)

[3] In an unreported table, we find that over-deviated firms are unlikely to undertake domestic industrially diversifying acquisitions.

[4] In 1998, foreign acquisitions by UK firms accounted for 65 per cent of total UK acquisitions value (UNCTAD, 2000).

constituted 31 per cent of the world's total volume of foreign acquisitions (UNCTAD, 2000). In 2012, the value of foreign acquisitions by UK firms was five times greater than the value of UK domestic acquisitions (see Office for National Statistics (ONS, 2013). Kollewe (2011) similarly reports that the UK has become the second largest buyer of foreign firms in the world. Second, the UK's bankruptcy codes are creditor-oriented, which usually results in prompt sales of bankrupt firms with no heed to the interests of other claimants (Davydenko & Franks, 2008). These strict codes provide a powerful setting in which to test the relationship between over-deviated firms and foreign acquisitions, since UK over-deviated firms might have greater incentives and pressure to diversify their default risk than peer firms in other contexts.

Using a sample of 5,746 completed bids by UK firms from 1987 to 2012, we find that leverage deviation affects the likelihood of making foreign acquisitions as well as the size of these acquisitions. In particular, over-deviated firms are more likely to acquire foreign targets than domestic targets. We also observe that over-deviated firms reduce their precautionary demand for cash holdings, as evidence of relaxing their financial constraints, after making foreign acquisitions.[5] We show that over-deviated firms are exposed to lower risk of default after acquiring foreign targets. We complement our analysis by exploring the effect of foreign acquisitions on over-deviated firms' value and performance. We observe that foreign acquisitions enhance the actual value of over-deviated firms. We also find that over-deviated acquirers of foreign targets out-perform other acquirers. Finally, our results are robust to controlling for firm fixed effects and self-selection bias of foreign acquisitions, ensuring that drivers and economic consequences of these deals do not arise from either unobserved firm-specific characteristics or endogeneity effect.

[5] Erel, Jang, and Weisbach (2015) observe that cash holdings reflect manager' assessments of their potential financial constraints. Accordingly, managers reduce their cash holdings when they believe that their financial constraints are relieved.

Our findings contribute to the extant literature on the interdependence of capital structure and investment decisions. In particular, this paper extends the work of Morellec and Zhdanov (2008), Uysal (2011) and Harford et al. (2009) by addressing the effect of leverage deviation on firms' choices between foreign and domestic acquisitions. It provides strong evidence that UK firms take their target leverage level into account when they make foreign acquisition decisions. Specifically, it adds to the M&A literature by establishing empirically that over-deviation from target leverage influences the likelihood and the size of foreign acquisition investments.

Next, this paper extends the literature on the controversial issue of why UK foreign acquisitions are quite pervasive (Ozkan, 2012). It empirically investigates the main drivers of these foreign direct investments when carried out by over-deviated firms. A previous study by Erel et al. (2015) finds that M&A deals ease the financial constraints of target firms. However, this paper provides new evidence that over-deviated acquirers can exploit foreign acquisitions to relieve their financial constraints. It also introduces compelling evidence that over-deviated firms can globally diversify their risk of default when acquiring foreign targets. These findings support the premise of co-insurance theory that the main motive of foreign acquisitions can be to outweigh over-deviated firms' risk of default and financial constraints.

Further, to the best of our knowledge, no previous study has examined outcomes of foreign acquisitions when acquirers' leverage level is above its target. Contrary to Moeller & Schlingemann's (2005) view that foreign acquisitions may destroy shareholders value, our findings suggest that foreign acquisitions are a value-adding decision for over-deviated firms. This paper also provides novel evidence that over-deviated firms experience better performance following foreign acquisitions than domestic acquisitions. Accordingly, these findings support the view of previous literature (e.g. Gande et al., 2009; Dos Santos et al., 2008)

that global diversification is a wealth-maximising decision and over-deviated firms pursue the most value-enhancing acquisitions (Uysal, 2011).

Overall, this paper documents that co-insurance effects (financial constraints and distress risk), enhancing firms' value and performance, are the main reasons for over-deviated firms to pursue foreign acquisitions.

This paper has potential implications for academics and practitioners. First, treating all acquisitions as a single homogeneous group without distinguishing between foreign and domestic acquisitions might be misleading, due to international nature of foreign acquisitions, which, can change drivers and ultimate outcomes of doing them relative to domestic acquisitions. Second, our findings shed light on the importance of addressing heterogeneity in firms' leverage deviation, whether they acquire debt above or under target. This paper documents that the two deviated groups exhibit different behaviours toward choosing an acquisition type. Third, this paper strongly advises firms to identify how far their level of leverage deviates from target before choosing a specific target type. Specifically, identification of the economic gains of deviated firms following foreign versus domestic acquisitions will enable managers to develop strategic plans for better acquisition decisions. This also can help policy makers to develop codes of best practice in order to assess whether management boards are compliant with their fiduciary responsibilities, as defined in company laws.

In the remainder of this paper, Section 2 introduces the main hypotheses, Section 3 outlines our sample and methodology, Section 4 reports our empirical findings, Section 5 introduces further robustness checks, and Section 6 provides some concluding remarks.

2. Hypothesis development

2.1 Over-deviated firms' incentives for foreign acquisitions

Over-deviated firms face a higher risk of default that reduces their ability to issue debts from the capital market (Kayhan & Titman, 2007; Dang et al., 2012). Consistent with this argument, Morellec and Zhdanov (2008) find that over-deviated firms lose takeover bidding

contests due to financial constraints. Harford et al. (2009) find that over-deviated firms are less likely to finance their investments with debt. Uysal (2011) shows that the high costs associated with raising finance from external capital markets reduce over-deviated firms' intentions to engage in acquisition transactions. These findings suggest that, in the presence of financing frictions, over-deviated firms may forego valuable investment opportunities.

However, co-insurance theory provides some insights on how over-deviated firms can reduce their financial constraints and credit risk. In particular, this theory argues that, to some extent, diversified firms have uncorrelated cash-flow streams which, in turn, reduce their earnings fluctuations. This reduction in earnings volatility reduces the likelihood of default for these firms and maximise their borrowing capacity at attractive rates (Lewellen, 1971). Consistent with co-insurance theory, Hann et al. (2013) find diversification reduces both default and systematic risk which, in turn, minimises not only the cost of debt, but also the total cost of capital. They further show that these co-insurance benefits are more pronounced in financially-constrained firms. Thus, we expect that over-deviated firms are more inclined to involve in diversifying acquisitions.

Diversifying acquisitions exist when target firm operates outside acquirer`s industrial sector known as industrial diversification or located in foreign countries known as global diversification (Ahmed & Elshandidy, 2016; Dos Santos et al., 2008). However, Heston and Rouwenhorst (1994) document that the decline in financial distress risk is stronger in global diversification than in industrial diversification. They find that global diversification is associated with country-specific factors (e.g. monetary and fiscal policies, institutional and legal regimes, and regional economic shocks) that dilute cash-flow fluctuations better than industrial diversification in one country. Baker et al., (2009) find that firms can relax their financial constraints by acquiring foreign targets from countries with a low cost of capital. Francis et al. (2008) show that firms acquire foreign targets to relieve their financial constraints

through internal capital markets, or indirectly through access to external capital markets. Based on these empirical findings, our paper expects that over-deviated are more likely to involve in foreign acquisition deals in order to seize a co-insurance benefits of global diversification.

Overall, different from other related work, our paper extends findings on the influence of over-deviation from target leverage on either firms' decision to undertake domestic acquisitions (Usyal, 2011), acquirers' payment methods (Harford et al., 2009), or targets' financial constraints (Erel et al., 2015). In doing so, our paper investigates whether over-deviated firms are likely to take foreign acquisitions as a way of diversification, and, if so, whether such engagement is due to these firms' desires to ease their financial constraints and distress risk. Further, all the above-mentioned papers concern different contexts (mostly the US) from the UK market which has distinctive characteristics. For instance, the bankruptcy codes in the UK are creditor-oriented, resulting in sales of bankrupt firms with no heed to the interests of other claimants; such actions cannot even be challenged in the courts (Davydenko & Franks, 2008). Accordingly, motivated by the UK's strict bankruptcy codes, UK over-deviated firms might have greater incentives to relieve their risk of default than counterparts in other contexts.

Taken all together, according to co-insurance theory, over-deviated firms are motivated to undertake foreign acquisitions in order to relax their financial constraints and reduce their risk of default. This discussion leads to the following subsequent hypotheses:

H1: Over-deviated firms are more likely to undertake foreign acquisitions.

H2: The financial constraints of over-deviated firms are likely to improve after foreign acquisitions.

H3: The financial distress risk of over-deviated firms is likely to improve after foreign acquisitions.

2.2 Foreign acquisitions and over-deviated firms' value and performance

Jensen (1986) advocates that firms should increase their leverage level in order to minimise conflict between shareholders and managers by restricting managerial discretion over future free cash flows. Managers of over-deviated firms are exposed to high pressures arising from a high risk of default; thus, they are motivated to improve firm performance due to fear of losing their jobs in case of default (Berger & Patti, 2006). Furthermore, if they are intending to make an acquisition, they are likely to be selective and choose the most value-enhancing deal. Uysal (2011) supports this notion and documents positive abnormal returns following the announcement of acquisitions by over-deviated firms. Thus, we expect that over-deviated firms' choice of a specific type of acquisition will be based on improving their performance and value.

In addition, co-insurance theory suggests that over-deviated firms may become involved in foreign acquisitions as a means of global diversification, in order to ease their financial constraints and minimise their risk of default. Berger and Ofek (1995) observe that diversification destroys firms' value. In contrast, Graham et al. (2002) document that diversifying acquisitions does not cause value discount. They find that value discount appears because firms are acquiring an already discounted business target. Hann et al. (2013) report that diversification leads to a five to six per cent increase in firm value. Further, global diversification through foreign acquisitions provides financial benefits, real benefits and other benefits (Gande et al., 2009; Morck & Yeung, 1992). Financial benefits arise from providing investors with a valuable, multinational, diversified portfolio through indirect access to countries with restrictions on portfolio holdings and capital flows or information asymmetries (Errunza & Senbet, 1984).[6] Real benefits are derived from combining acquirers' and targets' information-based intangible assets, patents, marketing abilities, brand names and technical

[6] Similarly, firms may diversify globally through foreign acquisitions more cheaply than global diversification by individual shareholders (Denis, Denis, & Yost, 2002).

knowledge (Morck & Yeung, 1992; Barney, 1991). Other benefits of foreign acquisitions include maximising acquirers' market access, combining research and development (R&D) capabilities with those of targets, avoiding trade barriers, and exploiting economies of scale (Morck & Yeung, 1992; Ghauri & Buckley, 2003; Li, Li, & Wang, 2016).

Previous studies confirm the positive valuation effects of global diversification benefits. Errunza and Senbet (1984) find that the financial benefits of global diversification have a positive impact on firm value, and Gande et al. (2009) observe that the financial and real benefits of global diversification increase firm value measured by Tobin's q. Francis et al. (2008) find that global diversification is a value-maximising decision, while Doukas and Kan (2006) find that global diversification does not destroy firm value. Overall, various benefits of foreign acquisition may push over-deviated firms to make wealth-maximising decisions by acquiring foreign targets. This discussion leads to the following hypotheses:

H4: Foreign acquisitions are value-creation deals for over-deviated firms.

H5: Foreign acquisitions enhance over-deviated firms' performance.

3. Methodology

3.1 Sample

Using the Thomson One database, we collect M&A data for UK public acquirers for the period 1 January 1987 to 31 December 2012.[7] Following criteria used by Uysal (2011), Harford et al. (2009) and Conn, Cosh, Guest, and Hughes (2005), we exclude financial (SIC 6000–6999) and utility (SIC 4900–4999) acquirers, since these are subject to regulatory constraints and different accounting considerations. In order to be included in the sample, the target must be a public, private or subsidiary firm. Acquisition deals must be completed and might be either domestic or foreign. The payment method must be cash, stock or a combination of both. As a cut-off point, we employ a minimum deal value of one million dollars in order to

[7] Based on data availability, we collect acquisitions data from 1984 to 2012. However, prior to 1987 the data coverage on UK acquisitions bids is very low (Antoniou, Petmezas, & Zhao, 2007).

avoid results generated by very small targets (Uysal, 2011; Antoniou et al., 2007). We exclude all deals labelled as minority stake purchases, acquisitions of remaining interest, privatisations, leveraged buyouts, spinoffs, recapitalisations, self-tenders, and exchange offers and repurchases (Alexandridis, Fuller, Terhaar, & Travlos, 2013). We also drop firm-year observations with missing data for any independent variable in our models. Accordingly, our final sample comprise 1,394 unique non-financial UK public firms that have acquired 3,416 domestic targets and 2,330 foreign targets. All financial data for each public acquirer are downloaded from the Datastream database.

3.2 Proxy for over-deviated firms

According to Harford et al. (2009), leverage deviation is defined as actual market leverage ratio minus target leverage ratio.[8] To estimate target leverage ratio, we use firms listed on the London Stock Exchange from 1980 to 2012. This period represents all data available for UK non-financial public firms from Datastream. We run a Tobit regression model of market leverage ratios on lagged values of the main determinants of capital structure to estimate the target leverage (Kayhan & Titman, 2007). We use a Tobit analysis since the dependent variable is restricted between zero and one. The main determinants of UK market leverage include the return on assets (ROA) ratio, the market-to-book (MTB) ratio, firm size, asset tangibility, non-debt tax shield, liquidity ratio, and industry and year fixed effects (Ozkan, 2001; Drobetz & Wanzenried, 2006; Rajan & Zingales, 1995; Dang, 2013).[9]

The ROA variable is a proxy for a firm's past profitability. Myers and Majluf (1984) argue that firms prefer to raise capital from retained earnings rather than from external sources

[8] Actual market leverage ratio is measured as total debt divided by the sum of total debt plus market value equity (Harford et al., 2009).

[9] We follow UK papers (Ozkan, 2001; Dang, 2013) in identifying the main determinants of UK firms' target leverage. Other US studies (Harford et al., 2009; Kayhan & Titman, 2007) suggest using variables such as R&D expenses and selling expenses to estimate target leverage. However, the coverage of these data in Datastream is low. For example, using R&D data leads to a 52 per cent reduction in our sample due to missing data. Similarly, around 20 per cent of our sample is lost as a result of including the selling expense variable. In addition, Hovakimian et al. (2001) confirm that our MTB variable captures the same effect as both R&D and selling expense variables. In the robustness section we use these variables and obtain the same results.

of finance. Thus, profitable firms with sufficient retained earnings will rely less on issuing debt to finance future projects (Dang, 2013; Fama & French, 2002). The firm size variable is included because large firms are more diversified and may have more stable cash flows than small firms (Titman & Wessels, 1988). Accordingly, large firms are exposed to lower risk of default and are able to expand their leverage level at more favourable interest rates than small firms (Ozkan, 2001). MTB controls for firm growth opportunities, which are intangible in nature and valuable as long as the firm exists; however, they have limited collateral value if the firm becomes insolvent (Titman & Wessels, 1988). Thus, lenders view firms with more growth options as risky investments and seek higher compensation (Harris & Raviv, 1991). In contrast, tangible assets may preserve their market value more than intangible assets, and thus may be used as collateral for debt in case of liquidation (Antoniou, Guney & Paudyal, 2008). Collateral debt may also restrict a firm's ability to engage in asset substitution and risk-shifting activities, thus reducing the agency costs of debt (Titman & Wessels 1988; Harris & Raviv 1991; Jensen & Meckling, 1976). Accordingly, creditors accept lower premiums from firms with high tangible assets. Non-debt tax shields (NDTS), such as depreciation, amortisation and investment tax credits, may substitute for tax deduction benefits associated with using debt which, in turn, reduce a firm's motivation to acquire more debt (DeAngelo & Masulis, 1980). Furthermore, firms with a high liquidity ratio may employ liquid assets such as accumulated cash to fund their investments, rather than issuing further debt (Ozkan, 2001). Industry dummies, based on Fama and French's 12-industry classification, capture the industry effect on leverage. Harris and Raviv (1991) argue that firms within an industry tend to have approximately the same leverage level, and that this level varies among industries. For example, capital-intensive manufacturing industries usually have a higher leverage ratio than high-tech industries (Antoniou et al., 2008). Finally, a year dummy controls for unobserved effects over time.

Appendix B reports the coefficient estimates of a Tobit model of target market leverage. It shows that, consistent with prior literature (e.g. Dang, 2013; Ozkan, 2001; Antoniou, Guney & Paudyal, 2008), ROA, MTB, NDTS and liquidity variables have a negative association with market leverage. In contrast, consistent with previous studies (e.g. Ozkan, 2001; Harris & Raviv, 1991), firm size and asset tangibility variables have a positive relationship with market leverage. These findings are statistically significant at the 1 per cent level.

Finally, we use the estimated target market leverage in Appendix B to calculate the leverage deviation variable which equals actual market leverage minus estimated target market leverage. We then use leverage deviation variable to construct an over-deviated firm proxy that takes the value of one if the firm has a positive leverage deviation and zero otherwise.

3.3 Empirical models

We use the constructed over-deviated firm proxy to address whether these firms were motivated to undertake foreign acquisitions. To that end, we adopt the following Probit model to test H1:

$$P(\text{foreign acquisition} = 1) = \Phi(\beta_0 + \beta_1 \text{ over-deviated firm}_{i,t-1} + \sum \beta_i \text{Controls}_{i,t-1}) \quad (1)$$

Probit model is employed, since the dependent variable (Foreign acquisition) is a binary variable that takes the value one if a firm acquires a foreign target and zero if it acquires a domestic target. Control variables include firm size, ROA, MTB, market leverage and stock return, estimated one year prior to the acquisition announcement year (Harford et al., 2009; Uysal, 2011; Almazan, De Motta, Titman, & Uysal, 2010).[10] We also control for industry characteristics, using an industry M&A liquidity index (Schlingemann, Stulz, & Walkling, 2002), the Herfindahl index (Uysal, 2011) and Fama and French 12-industry dummies. We use year fixed effects to control for unobserved effects over time. We further employ random-

[10] Following Harfordet al. (2009), the inclusion of a market leverage variable in all of our models is required to ensure that our main leverage deviation variable does not estimate the effect of pre-acquisition market leverage but really proxies the effect of deviation from target leverage.

effects models to control for unobserved heterogeneity that might be correlated with the likelihood of undertaking a foreign acquisition. We do not employ fixed-effects models, owing to the small amount of within-firm variation in M&A activities, which would exclude more than 37 per cent of our sample observations.

We further investigate whether over-deviation from target market leverage affected the size of foreign acquisitions. We construct a dependent variable that equals foreign acquisitions value divided by total assets. We run a random-effects Tobit model using the previous explanatory variables, since the dependent variable is censored at zero. Fixed-effects estimations of coefficients of Tobit analysis are not allowed, since Tobit is a non-linear model and its maximum estimates are biased.

Next, we explore the potential reasons for over-deviated firms to undertake foreign acquisitions. First, consistent with Erel et al. (2015), in order to test H2 we explore how over-deviated firms position their cash holdings policy before and after foreign acquisition events as a measure of their financial constraints. Almeida, Campello, and Weisbach (2004) argue that the fraction of cash retained reflects a manager's assessment of a firm's potential financial constraints. Specifically, in the presence of financing frictions, financially-constrained firms hold more cash on their balance sheets in order to finance their important investments (Erel et al., 2015). Thus, we construct a dependent variable that measures the change in the ratio of the acquirer's cash holdings to total assets around an acquisition (Erel et al., 2015). We regress this dependent variable on an interaction variable of over-deviated firms and foreign acquisitions in order to test the effect of foreign acquisitions on over-deviated firms' cash holdings level, as follows:

$$\Delta \text{(cash holdings)} = \beta_0 + \beta_1 \text{ over-deviated} \times \text{foreign acquisitions}_{i,t-1} + \sum \beta_i \text{ controls}_{i,t-1} + \varepsilon_{i,t} \quad (2)$$

Furthermore, we employ the following OLS model to test the effect of foreign acquisitions on over-deviated firms' likelihood of default (H3):

$$\text{Z-score}_{i,t} = \beta_0 + \beta_1 \text{ over-deviated} \times \text{foreign acquisitions}_{i,t-1} + \sum \beta_i \text{controls}_{i,t-1} + \varepsilon_{i,t} \quad (3)$$

Following Chen and Wang (2012), our dependent variable is Altman's (1986) Z-score model one year after the effective year of an acquisition. Altman's Z-score is negatively correlated with the probability of default (Chen & Wang, 2012), meaning that the higher the value of Z-scores, the lower the likelihood of default.

Further, we examine the effects of foreign acquisitions on over-deviated firm value and operating performance using the following OLS models to test H4 and H5.

$$\Delta(\text{Tobin's q}) = \beta_0 + \beta_1 \text{ over-deviated} \times \text{foreign acquisitions}_{i,t-1} + \sum \beta_i \text{controls}_{i,t-1} + \varepsilon_{i,t} \quad (4)$$

$$\Delta(\text{ROA}) = \beta_0 + \beta_1 \text{ over-deviated} \times \text{foreign acquisitions}_{i,t-1} + \sum \beta_i \text{controls}_{i,t-1} + \varepsilon_{i,t} \quad (5)$$

Model 4 examines the effect of foreign acquisitions on over-deviated firm value measured by Tobin's q. The change in Tobin's q variable is measured as Tobin's q one year after, minus Tobin's q one year before the effective year of an acquisition. Model 5 explores the operating synergy effects of foreign acquisitions on over-deviated firms. The dependent variable is the change in ROA around an acquisition, in particular ROA one year after, minus ROA one year before the effective year of an acquisition.

Finally, in Models 2 to 5, we run firm fixed effects OLS to control for endogeneity problems resulting from unobserved heterogeneity of a firm-specific and/or time-invariant nature. In all the estimations, the robust standard errors are clustered at the firm level, except in the random-effects Tobit models, where we use bootstrapping since it is difficult to cluster the standard error in the presence of censored data (Efron, 1979). We also include a year fixed effect in the regression model to control for macroeconomic changes in the time series.[11]

[11] We also rerun all the previous empirical models using the continuous variable of leverage deviation.

4. Empirical Findings

4.1 Descriptive statistics

Panel A of Table 1 reports descriptive statistics for the dependent variables used in our analysis. It shows that, over the sample period of 27 years, foreign (domestic) acquisition deals represent around 41 (59) per cent of the full acquisition sample. It also shows that the change in cash holdings around acquisition deals is negative. As shown in Panel A, the Z-score following an acquisition is on average 3.219, and acquisition transactions are value-destroying investments. In particular, UK acquirers face on average a 0.299 decline in the mean value of the change in Tobin's q around acquisition transactions. Further, they suffer deterioration in the average value of the change in ROA around an acquisition.

[Insert Table 1]

In addition, panel B of Table 1 presents the main statistics for the explanatory variables used in our analysis. These descriptive statistics are calculated from a sample of 5,746 firm-year observations. Panel B reveals that the mean market leverage in the sample is 0.152. It also shows that the average value of leverage deviation is -0.049. This means that, on average, UK acquirers maintain their actual market leverage at a level lower than target leverage. These findings lend support to Davydenko and Franks' (2008) view that strict UK bankruptcy codes boost UK firms to reduce their market leverage ratio relative to the target. Further, the leverage deviation variable has a standard deviation of 0.126 around the mean, which implies the existence of sub-groups of firms that deviate from their target leverage. In particular, over-deviated firms represent around 29 per cent of UK public acquirers, while around 71 per cent of UK public acquirers have actual market leverage less than target leverage.

4.2 Testing H1: does deviation from target leverage affect the likelihood and size of foreign acquisitions?

This section presents the results of multivariate analyses to investigate whether over-deviation from target leverage may explain a firm's choice between foreign and domestic acquisitions. We use a random-effects Probit analysis of a dataset of 5,746 firm-year

observations to estimate the likelihood of making a foreign acquisition. We further run a Tobit analysis to estimate the ratio of the sum of foreign acquisition value to the acquirer's total assets.

[Insert Table 2]

Table 2 reports the coefficient estimates of the Probit models (Columns 1 and 2) and Tobit models (Columns 3 and 4). Column 1 shows a positive significant relationship between leverage deviation and the likelihood of acquiring a foreign target. Column 3 shows that leverage deviation increases the size of foreign acquisition investments relative to domestic acquisitions. We further estimated the average marginal effects of the Probit models, since it is difficult to interpret their coefficients and also to assess the economic significance of the relationship between leverage deviation and the dependent variable. The marginal effect of the leverage deviation variable is 0.870 and its standard deviation is 0.126. Thus, a one-standard-deviation increase in leverage deviation is associated with a 27 per cent (0.870 × 0.126/foreign acquisition sample mean of 0.405) increase in the likelihood of undertaking foreign acquisitions. These findings indicate that leverage deviation has a reasonable economic impact on a firm's choice between foreign and domestic acquisitions.

Next, Column 2 of Table 2 shows that over-deviated firms are more inclined to acquire a foreign target than a domestic target. Column 4 documents that over-deviated firms invest more in foreign acquisitions than do under-deviated firms. The marginal effect of over-deviated firms confirms that this has a non-trivial economic impact on foreign acquisitions. Specifically, we find that moving from an under-deviated group to an over-deviated group (a move from 0 to 1) increases the likelihood of a foreign acquisition by 0.056, an increase of 13.8 per cent (0.056/foreign acquisition sample mean of 0.405) over the sample average. Overall, these findings are in line with the notion of co-insurance theory that over-deviated firms become

involved in foreign acquisitions as a means of global diversification. Thus, we accept H1, that over-deviated firms are more likely to make foreign acquisitions than domestic acquisitions.

For the other control variables, Table 2 shows that bigger firms have a higher probability of acquiring foreign targets than smaller firms. It also shows that firms with higher ROA are less likely to acquire foreign targets. We observe that the MTB variable has a significant positive impact on firms' decisions to undertake foreign acquisitions. Finally, we find that market leverage reduces the probability of pursuing a foreign acquisition.

4.3 Testing H2: do foreign acquisitions by over-deviated firms affect their cash holdings level?

This section explains the relationship between the foreign acquisitions and financial constraints of over-deviated firms.[12] Table 3 reports the coefficient estimates of firm fixed effects of foreign acquisitions on over-deviated firms' cash holdings.

[Insert Table 3]

Column 1 reveals that leverage deviation reduces the precautionary demand for cash holdings following engagement in domestic acquisitions and foreign acquisitions, by 0.058 and 0.093 (0.058 + 0.035) respectively. Further, the interaction term between over-deviated firms and foreign acquisitions, in Column 2, shows that over-deviated firms hold 0.008 less cash subsequent to foreign acquisition transactions. This is in line with Erel et al.'s (2015) finding that reductions in the level of cash holdings following foreign acquisitions may suggest that the financial constraints of over-deviated firms are lessened. These results are also economically significant, since the mean value of the change in the ratio of the cash holdings to total assets in our sample is 0.027. Thus, the coefficient of the interaction term represents a 30 per cent (0.008/0.027) decline in the mean of the change in cash holdings to total assets. Overall, our empirical results show that over-deviated firms change their financial policies

[12] We run t-statistics of the difference in mean values of changes in cash holdings between foreign and domestic acquisitions. We get significant results that foreign acquisition deals have a superior effect in relaxing acquirer's financial constraints, compared to, domestic acquisitions.

from being constrained to unconstrained following involvement in foreign acquisitions. Thus, we accept H2, that the co-insurance effect through relieving over-deviated firms' financial constraints is one of the main motivators for these firms to pursue foreign acquisitions.

Table 3 also presents that bigger firms increase their cash holdings after engaging in an acquisition, showing that firms with higher market leverage or with more tangible assets hold more cash after undertaking an acquisition. Finally, the stock return variable has a positive association with the level of cash holdings following an acquisition.

4.4 Testing H3: do foreign acquisitions affect the likelihood of default of over-deviated firms?

This section explores another potential motivation for over-deviated firms to undertake foreign acquisitions. In particular, it addresses the relationship between foreign acquisitions and risk of default of over-deviated firms.

[Insert Table 4]

Table 4 reports within-firm effects of foreign acquisitions on the Altman Z-score of over-deviated firms. According to Chen and Wang (2012), the higher the Altman Z-score, the lower the probability of default. Column 1 does not show a significant association between leverage deviation and the Z-score variable following either domestic or foreign acquisitions.

Furthermore, the increase in the likelihood of default following foreign acquisitions becomes clear and significant when we disentangle the effect of over-deviated firms from under-deviated firms. The interaction between over-deviated firms and foreign acquisitions, shown in Column 2, reveals that over-deviated firms have a 0.352 higher Z-score after acquiring foreign targets. This implies that over-deviated firms are exposed to a lower risk of default following foreign acquisition transactions. In terms of economic significance, the mean value of the Z-score proxy in the sample is 3.219; thus, the coefficient of the interaction variable represents an 11 per cent (0.352/3.219) improvement over the sample mean of the Z-score variable. Overall, these findings suggest that the risk of default of over-deviated firms declines

significantly and economically after acquiring foreign targets. Thus, we accept H3, which supports the role of a co-insurance effect in undertaking foreign acquisition deals. In particular, it shows that one financial incentive of over-deviated firms for undertaking foreign acquisitions is to reduce their risk of default.[13]

Finally, Table 4 shows that acquirers with higher ROA, MTB and stock returns face a lower risk of default after making an acquisition. It also shows that larger firms have a higher likelihood of default after involvement in an acquisition. This increase in the risk of default with firm size is consistent with the hubris hypothesis that managers of larger firms may undertake acquisitions due to overconfidence in their ability rather than economic gain from these acquisitions (Roll, 1986).

4.5 Testing H4: do foreign acquisitions affect over-deviated firms' value?

This section presents evidence on the economic consequences of foreign acquisitions for over-deviated firms, specifically changes in over-deviated firms' Tobin's q following these deals.

[Insert Table 5]

Table 5 reports the firm fixed effects of foreign acquisitions on changes over-deviated firms value. Column 1 shows that leverage deviation has a significant negative influence on changes in Tobin's q following involvement in domestic acquisitions. The coefficient of the interaction between leverage deviation and foreign acquisitions is positive, but lacks statistical significance. The interaction variable, shown in Column 2, reveals that over-deviated firms experience significant positive changes in Tobin's q after making foreign acquisitions. These results are in line with Uysal's (2011) finding that over-deviated firms are more likely to be

[13] Arguably, combining both global and industrial diversification dimensions by acquiring foreign targets from different industry can trigger more uncorrelated cash-flow streams arising from operating simultaneously in different markets and industries. In an unreported table, we construct a subsample of foreign and industry diversifying acquisition deals to examine their effect on over-deviated firms' distress risk. Foreign and industry diversifying acquisitions are deals in which the acquirer's country and two-digit SIC code are different from that of the target (Ahmed & Elshandidy, 2016; Dos Santos et al., 2008). We find that these deals significantly and economically reduce over-deviated firms' risk of default.

selective and to choose the most value-enhancing acquisition deals. These results also support Gande et al.'s (2009) and Francis et al.'s (2008) finding that global diversification is a value-creating decision. These results are robust after controlling for firm fixed effects to confirm that the positive valuation effect of foreign acquisitions does not arise from unobserved firm-specific characteristics. In brief, H4 that foreign acquisitions by over-deviated firms are wealth-maximising deals is accepted.

For other control variables, Table 5 shows that, consistent with the hubris hypothesis, acquisitions are value-destructive deals for larger firms. The MTB variable reduces firms' Tobin's q after making an acquisition. This supports Fu et al.'s (2013) view that acquisitions driven by overvaluation effects are wealth-loss deals. Table 5 reveals that industry liquidity and capital expenditure variables have a negative association with the Tobin's q following an acquisition, and that firms with higher market leverage enhance their value by undertaking an acquisition.

4.6 Testing H5: do foreign acquisitions affect over-deviated firms' operating performance?

This section studies the relationship between foreign acquisitions and operating synergies. In particular, it addresses the effect of foreign acquisitions on the operating performance of over-deviated firms.

[Insert Table 6]

Table 6 presents the coefficient estimates of the firm fixed effects on changes in ROA of over-deviated firms around foreign acquisitions. Column 1 shows that leverage deviation has a significant negative influence on changes in ROA following an acquisition. However, the interaction variable does not support a clear improvement in ROA; it reveals that leverage deviation enhances firms' operating performance after making foreign acquisitions relative to domestic acquisitions.

Column 2 shows that over-deviated firms that undertake foreign acquisitions outperform those that make domestic acquisitions. It reports that over-deviated firms

experience significant positive (negative) changes in ROA after making foreign (domestic) acquisitions. The coefficient estimate of the interaction variable shown in Column 2 implies that foreign acquisition deals have a non-trivial economic impact on over-deviated firms' performance. It shows that foreign acquisitions by over-deviated firms are associated with a 68 per cent (0.013/change in ROA sample mean of 0.019) increase in the mean change of ROA. These findings confirm the results given in the previous section, that foreign acquisitions are good investments for over-deviated firms, by showing that these deals generate positive synergy for these firms. They also support the conjecture of Morck and Yeung (1992) and Barney (1991) that foreign acquisitions improve the performance of the acquirers due to the real benefits associated with these deals, such as combining acquirers' and targets' information-based intangible assets, expanding market access and avoiding trade barriers. Accordingly, we accept H5, that foreign acquisitions enhance over-deviated firms' performance.

Finally, Table 6 shows that, consistent with managerial hubris, the firm size variable reduces operating performance following acquisitions by 0.054. It reveals that liquidity and MTB have a negative association with operating performance around M&A deals. In contrast, the market leverage and stock return variables have a positive relationship with the change in ROA around M&A deals.

5. Robustness checks

5.1 Multinomial logit for the likelihood of foreign acquisitions

As a further robustness check, we run a multinomial model (see Appendix C) to explore the effect of over-deviation from target leverage on the likelihood of foreign acquisitions To run this model, we combine M&A data collected for the period 1987 to 2012 with data for the same period for all UK listed firms available from Datastream. Then, a dependent variable is constructed with three different categories: firms that undertook foreign acquisitions, firms that undertook domestic acquisitions and firms that were not engaged in acquisitions. These three

categories are considered as alternatives without implicit order. Accordingly, a multinomial logit model is employed and domestic acquisitions are chosen as a reference group.

Column 1 shows that leverage deviation increases the likelihood of making foreign acquisitions. Column 2 reveals that over-deviated firms are more likely to acquire foreign than domestic targets. Columns 3 and 4 illustrate that both deviation and over-deviation from target leverage negatively affect the likelihood of making an acquisition relative to the reference group. In summary, the estimates of the multinomial logit model confirm the prior findings of the literature that over-deviation from target leverage impedes a firm's ability to make an acquisition (Uysal, 2011). They further support our previous findings that, when over-deviated firms decide to make an acquisition, they prefer foreign targets.

5.2 Financial constraints

5.2.1 The cash-flow sensitivity of cash holdings

Almeida et al. (2004) and Erel et al. (2015) suggest another way to measure financial constraints, by capturing the firm's propensity to save cash out of cash flows, known as the cash-flow sensitivity of cash holdings. They assume that constrained firms save a positive fraction of cash flows to finance their future investments, while unconstrained firms do not follow the same saving behaviour, since they are able to fund all of their positive NPV investments. Thus, as shown in Appendix D, we include cash flow divided by total assets as an independent variable to account for the cash-flow sensitivity of assets prior to the acquisition. We find that the cash flow variable has a positive significant association with changes in cash holdings. This indicates that acquiring firms are financially constrained before making an acquisition, since they save a positive fraction of their cash flows (normalised by total assets) as precautionary cash holdings. In contrast, Appendix D illustrates that over-deviated firms reduce their cash holdings following foreign acquisitions in a way that supports a reduction in their financial constraints.

5.2.2 Hadlock and Pierce (HP) and Whited and Wu (WW) indices

We use other financial constraint proxies, namely HP (2010) and WW (2006) indices, to assess whether the financial constraints of over-deviated firms are changed after undertaking foreign acquisitions. Appendix E presents the t-statistics of the difference in means for the two indices. Panel A examines the difference in means in these indices around over-deviated acquirers of foreign targets. Panel A reports that the HP and WW indices of over-deviated firms improve one year after involvement in foreign acquisitions, by 0.312 and 0.029 respectively. Further, Panel B examines differences in the means of HP and WW indices one year following an acquisition between over-deviated firms that make foreign acquisitions and other deviated acquirers. It shows that over-deviated firms are less financially constrained than other acquirers after making foreign acquisitions. Our results are significant at the one per cent level, lending preliminary support to the hypothesis that foreign acquisitions relax the financial constraints of over-deviated firms.

5.3 Self-selection of acquisition type

The empirical analysis of this paper discusses drivers and outcomes of foreign acquisitions by over-deviated firms. A potential limitation of our methodology is that acquisition type (foreign) is unlikely to be exogenous. Firms determine whether they want to acquire foreign targets, implying that this foreign acquisition variable may be endogenous. Thus, following Rosenbaum and Rubin (1983) Heckman, Ichimura, and Todd, (1998) Ge and Lennox (2011) to control for such selection bias, we employ propensity score matching by constructing a sub-sample of acquirers of domestic targets that are comparable to acquirers of foreign targets. We identify our control group by rerunning a Probit model in equation (1) that predicts the selection decision of foreign acquisitions (the likelihood of being treated) using the following matched variables: leverage deviation, firm size, ROA, MTB, market leverage, stock return, Herfindhal index, industry liquidity, industry fixed effect and year. Then, we employ the nearest neighbour matching approach by selecting an acquirer of domestic target

that has the closest propensity score for each acquirer of a foreign target. This matching approach is employed without replacement, which means that each acquirer in the control group can only appear and match one acquirer in the treated group (Ge & Lennox, 2011). We also restrict the observations to be on the common support. Specifically, we exclude acquirers in the control group whose propensity lies above the maximum value or below the minimum value of propensity score among acquirers in the treated group and vice versa. This guarantees that we do not match firms that are concentrated at the extreme boundaries (Saunders & Steffen, 2011). This match creates a matched sample of 4,570 including 2,285 acquirers of foreign targets and 2,585 acquirers of domestic targets. [14]

Appendix F tests drivers and outcomes of foreign acquisitions by over-deviated firms after correcting for self-selection bias. [15] It shows, using the matched propensity score method, that foreign acquisitions significantly improve over-deviated firms' financial constraints, performance and value, compared to, domestic acquisitions. These deals also relieve over-deviated firms' bankruptcy risk. These results confirm that our previous empirical findings reported in Tables 3 to 6 are robust and not affected by the selection-bias problem.

5.4 New proxy for over-deviation

Uysal (2011) defines over-deviation from target leverage as a firm that has excessive positive leverage deviation. Specifically, an over-deviated firm variable is a dummy that takes the value of one if leverage deviation falls in the largest quartile. Appendix G shows the results from employing this new proxy to rerun all empirical models reported in Section 3.3. These are consistent with our previous findings, that over-deviated firms are more likely to acquire foreign targets. Further, the results confirm that reducing both financial constraints and

[14] In an unreported table, we run t-statistics of difference in means in our main independent variable, namely, leverage deviation between treated and control groups. We find that there is no significant difference in means, indicating that we have a reliable and robust match.

[15] In an unreported table, we estimate average treatment on treated (ATT) by computing the difference in acquisition outcomes between matched groups. We find that our treated group, namely, acquirers of foreign targets significantly outperform those matched acquirers of domestic targets.

financial distress risk are main motivators for over-deviated firms to undertake these acquisitions. Finally, enhancing over-deviated firms' value and performance are the main economic consequences of foreign acquisitions.

5.5 Cash holdings and the financial crisis

The failure of well-known financial institutions during the global financial crisis of 2007–2009 resulted in a freeze in global credit markets. This negative shock on the external supply of finance caused a sharp reduction in firms' cash holdings (Grave, Vardiabasis, & Yavas, 2012). Using survey data from 1,050 chief financial officers (CFOs) in the US, Europe and Asia, Campello, Graham, and Harvey (2010) found that around 86 per cent of constrained firms forwent and cancelled valuable investments during the global financial crisis. They also lost around a fifth of their cash holdings during the financial crisis. In addition, Song and Lee (2012) note that firms fundamentally changed their cash holding policies, not only during the financial crisis but also after this period: firms doubled their median cash holdings over the 10-year period following the financial crisis.[16] This raises the question of whether the decrease in cash holdings of over-deviated firms following foreign acquisitions was related to the effect of these foreign deals in relieving financial constraints, or may have derived from the effect of the global financial crisis on using these cash reserves. It is also questionable whether the negative relationship between the cash holdings of over-deviated firms and foreign acquisitions is still robust after the financial crisis period. To address these questions, we create three dummy variables representing the periods prior to, during and after the global financial crisis. The during financial crisis variable takes a value of one for the years of the financial crisis (2008 and 2009) and zero otherwise (Frankel & Saravelos, 2012). The dummy variables prior (post)

[16] Similarly, "According to the Liquidity Management Poll conducted by the American Productivity and Quality Center in March 2009, 9 out of 10 finance executives report that their companies have taken proactive measures to increase their cash holdings and made liquidity management a top corporate priority" (Song & Lee, 2012, p.617).

financial crisis take a value of one for the years before (after) the financial crisis period and zero otherwise. We then interact over-deviated firms with the during (post) crisis dummies.

As shown in Appendix H, over-deviated firms reduced their cash holdings in a manner consistent with their becoming less financially constrained after making foreign acquisitions. Further, the interactions between over-deviated and during (post) financial crisis show that, consistent with Campello et al. (2010) and Song and Lee (2012), over-deviated firms reduced (increased) their cash reserves during (post) the crisis. However, these findings lack statistical significance. In summary, Appendix H confirms that the reduction in cash holdings of over-deviated firms was driven mainly by undertaking foreign acquisitions and was not related to the effect of financial crisis periods.

5.6 New estimation of target leverage

Previous studies (e.g. Harford et al., 2009; Kayhan & Titman, 2007; Uysal, 2011) employ other variables, including R&D and selling expenses, in estimations of target market leverage. Harford et al. (2009) use a lagged proxy of R&D divided by sales to capture the potential growth opportunities of a firm. Firms with larger growth opportunities are expected to hold less leverage, since most of their value arises from intangible assets that have limited collateral value (Titman & Wessels, 1988). Furthermore, using R&D data would lead to a loss of almost 52 per cent of sample observations. Thus, following Uysal (2001), we replace missing R&D data with zeros. We also create an R&D missing dummy that takes a value of one if a firm has missing R&D data and zero otherwise. Harford et al. (2009) employe prior year selling expenses divided by sales to account for product uniqueness. Product uniqueness has a negative association with leverage, since it is more difficult and costly to liquidate unique products in the event of bankruptcy (Uysal, 2011; Titman & Wessels, 1988). Thus, we used these three variables in addition to other variables used previously (see Appendix B**)** to estimate the new target leverage. We then estimate both leverage deviation and over-deviation variables using the new target leverage.

As a further robustness check, we use the new constructed variables to explore the effect of over-deviation from target leverage on the likelihood of foreign acquisitions. Similarly to our previous findings, Columns 1 and 3 of Appendix I show that leverage deviation increases both the likelihood and the size of foreign acquisitions. Columns 2 and 4 confirm that over-deviated firms prefer foreign targets and invest more in those foreign deals.

5.7 Controlling for target characteristics

Arguably, controlling for target firms lagged characteristics is essential and may affect over-deviated firms' choice of the target. First, we include all control variables used in related prior literature (e.g. Uysal, 2011; Harford et al., 2009). Second, our sample contains 516 public targets, 3,356 private targets and 1,874 subsidiary targets. Thus, due to data availability, we can only collect data for public target firms that represent around 9% of our dataset.

Despite limited number of observations, and after controlling for public target characteristics including ROA, MTB, market leverage and firm size, we still get consistent results to those reported under Table 1. In particular, Appendix J estimates the likelihood of foreign acquisitions by over-deviated firms using both Probit models (Columns 1 and 2) and Tobit models (Columns 3 and 4). It shows, using only a dataset of 304 firm-year observations, that over-deviated firms are more inclined to involve in foreign acquisitions than domestic acquisitions. This indicates that our results are still robust even after capturing target firms' characteristics.

6. Conclusion

A growing number of studies investigate how target leverage affects corporate decisions. This paper goes further to examine whether firms with leverage levels above target are motivated by the co-insurance effect to undertake foreign acquisitions. It shows that over-deviated firms prefer to acquire foreign targets. Furthermore, in line with the co-insurance hypothesis, this paper provides evidence that foreign acquisitions dilute the default risk of over-deviated firms. The empirical results also show that over-deviated firms change their financial

policies subsequent to foreign acquisition events in a manner consistent with their becoming less financially constrained. These results confirm the potential effect of foreign acquisitions as a means of global diversification to mitigate over-deviated firms' financial constraints and financial distress risk. Accordingly, this paper extends the literature by focusing on the financial gains accrued in foreign acquisitions by over-deviated firms.

This paper also contributes to the literature by examining whether the co-insurance effects of foreign acquisitions are associated with real improvements in over-deviated firms' value and performance. It shows that foreign acquisitions actually maximise over-deviated firms' value. These findings support the view that global diversification through foreign acquisitions creates economic gains. In contrast to the previous literature, they also strongly support that foreign acquisitions are not value-destructive, but that over-deviated firms reap financial benefits from them. These results also support Uysal's (2011) conjecture that over-deviated firms pursue the most value-enhancing acquisitions. Finally, this study finds that over-deviated firms that acquire foreign targets outperform other acquirers. These findings confirm the favourable synergy effects of foreign acquisitions on over-deviated firms' performance. Overall, this paper contributes to the extant literature by providing novel evidence that co-insurance effects, enhancing firm value and positive synergy are the main motives for over-deviated firms to undertake foreign acquisitions.

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Tables

Table 1. Descriptive statistics of the sample

Panel A: Summary statistics of main dependent variables used in subsequent tables.

	N	Mean	SD	Median	Min.	Max.
Foreign acquisition	5,746	0.405	0.491	0.000	0.000	1.000
Foreign acquisitions value/TA	5,746	0.106	0.323	0.000	0.000	2.352
Δ cash holdings	5,421	-0.027	0.066	-0.010	-0.154	0.068
Z-score	5,279	3.219	2.313	2.942	-4.051	13.554
Δ Tobin's q	5,369	-0.299	1.250	-0.089	-7.273	2.727
Δ ROA	5,399	-0.019	0.142	-0.009	-0.660	0.516

Panel B: Summary statistics of main explanatory variables used in subsequent tables.

	N	Mean	SD	Median	Min.	Max.
Leverage deviation	5,746	-0.049	0.126	-0.068	-0.275	0.389
Over-deviated firms	5,746	0.289	0.453	0.000	0.000	1.000
Firm size	5,746	11.100	2.012	11.110	5.636	15.692
ROA	5,746	0.132	0.147	0.144	-0.641	0.455
MTB	5,746	2.185	1.788	1.653	0.616	12.748
Market leverage	5,746	0.152	0.141	0.122	0.000	0.664
Stock return	5,746	0.222	0.548	0.133	-0.741	2.674
Herfindhal index	5,746	0.334	0.239	0.265	0.055	1.000
Industry liquidity	5,746	0.113	0.185	0.046	0.000	0.929

Notes: Variable definitions are given in Appendix A. All continuous variables are winsorised at the one per cent level. The sample contains 1,394 unique non-financial UK public firms that acquired 3,416 domestic targets and 2,330 foreign targets between 1987 and 2012.The sample contains 516 public targets, 3,356 private targets and 1,874 subsidiary targets.

Table 2. Over-deviated firms and the likelihood of foreign acquisitions

	Foreign acquisition (1)	Foreign acquisition (2)	Sum foreign acquisition/ TA (3)	Sum foreign acquisition/ TA (4)
Leverage deviation	2.755***		0.918***	
[Marginal effects]	*[0.870]*		*[0.261]*	
	(5.72)		(5.87)	
Over-deviated firms		0.176**		0.044*
[Marginal effects]		*[0.056]*		*[0.012]*
		(2.40)		(1.70)
Firm size	0.308***	0.264***	0.058***	0.042***
	(15.56)	(14.38)	(7.22)	(5.50)
ROA	-0.433**	-0.249	-0.191**	-0.131*
	(-2.25)	(-1.26)	(-2.56)	(-1.76)
MTB	0.041*	0.078***	0.054***	0.066***
	(1.90)	(4.11)	(7.95)	(10.11)
Market leverage	-3.189***	-1.240***	-1.070***	-0.381***
	(-6.74)	(-4.24)	(-6.65)	(-3.54)
Stock return	-0.068	-0.100**	-0.005	-0.015
	(-1.54)	(-2.26)	(-0.28)	(-0.90)
Herfindhal index	0.033	0.004	-0.044	-0.052
	(0.28)	(0.03)	(-0.96)	(-1.13)
Industry liquidity	0.120	0.123	0.506***	0.510***
	(0.87)	(0.88)	(10.27)	(10.34)
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Random effect	Yes	Yes	Yes	Yes
N	5,746	5,746	5,746	5,746
Mean VIF	1.79	1.41	1.79	1.41

This table reports the coefficient estimates of random-effects Probit analysis (Columns 1 and 2) and random-effects Tobit analysis (Columns 3 and 4). The dependent variable in the Probit models takes the value one if the firm makes a foreign acquisition and zero otherwise. The Tobit analysis estimates the ratio of the sum of the foreign acquisitions value to the firm's total assets. Variable definitions are given in Appendix A. All continuous variables are winsorised at the 1 per cent level. T-statistics are reported in parenthesis. Standard errors are robust and clustered by firm for the Probit models and bootstrapped for the Tobit models. The estimates in the models are statistically significant at the (*) 10 per cent, (**) five per cent, and (***) one per cent levels.

Table 3. The impact of foreign acquisitions by over-deviated firms on cash holdings

	Δ cash holdings (1)	Δ cash holdings (2)
Leverage deviation	-0.058***	
	(-2.84)	
Leverage deviation×	-0.035**	
foreign	(-2.15)	
Over-deviated firms		-0.004
		(-1.01)
Over-deviated firms×		-0.008*
foreign		(-1.73)
Firm size	0.003**	0.004***
	(2.57)	(4.24)
ROA	-0.012	-0.017
	(-0.91)	(-1.31)
Asset tangibility	0.041***	0.050***
	(5.70)	(7.63)
MTB	-0.000	-0.001
	(-0.05)	(-0.79)
Market leverage	0.139***	0.094***
	(6.54)	(6.36)
Relative size	-0.002**	-0.002**
	(-2.56)	(-2.43)
Stock return	0.005**	0.006**
	(2.06)	(2.19)
Cash in an acquisition	-0.0001	-0.0001
	(-1.64)	(-1.59)
Herfindhal index	-0.008	-0.007
	(-1.28)	(-1.21)
Industry liquidity	0.002	0.002
	(0.30)	(0.29)
Foreign acquisitions	0.001	0.004*
	(0.51)	(1.84)
Year FE	Yes	Yes
Firm FE	Yes	Yes
N	5,421	5,421
R-square	0.152	0.152
Mean VIF	1.90	1.64

This table reports the coefficient estimates of fixed-effects OLS analyses. The dependent variable is changes in the ratio of cash holdings to total assets. Variable definitions are given in Appendix A. All continuous variables are winsorised at the one per cent level. T-statistics are reported in parenthesis. Standard errors are robust and clustered by acquiring firms. The estimates in the models are statistically significant at the (*) 10 per cent, (**) five per cent, and (***) one per cent levels.

Table 4. Impact of foreign acquisitions by over-deviated firms on the likelihood of default

	Z-score (1)	Z-score (2)
Leverage deviation	-2.613	
	(-1.07)	
Leverage deviation×	1.688	
foreign	(1.33)	
Over-deviated firms		-0.095
		(-0.48)
Over-deviated firms×		0.352*
foreign		(1.78)
Firm size	-0.365*	-0.333*
	(-1.90)	(-1.72)
ROA	1.469**	1.298*
	(2.27)	(1.86)
Liquidity	-0.279	-0.303
	(-1.24)	(-1.27)
Asset tangibility	-0.137	0.076
	(-0.22)	(0.14)
MTB	0.231***	0.206**
	(2.70)	(2.32)
Market leverage	0.367	-1.664**
	(0.21)	(-2.25)
Relative size	-0.006	-0.005
	(-0.23)	(-0.17)
Stock return	0.837***	0.851***
	(4.35)	(4.26)
Herfindhal index	0.341	0.325
	(0.84)	(0.81)
Industry liquidity	-0.517	-0.550
	(-1.49)	(-1.58)
Foreign acquisitions	0.232	0.045
	(1.43)	(0.51)
Year FE	Yes	Yes
Firm FE	Yes	Yes
N	5,279	5,279
R-square	0.132	0.130
Mean VIF	1.96	1.68

This table reports the coefficient estimates of fixed-effects OLS analyses. The dependent variable is bankruptcy estimated by the Altman Z-score one year after the effective year of acquisition. Variable definitions are given in Appendix A. All continuous variables are winsorised at the one per cent level. T-statistics are reported in parenthesis. Standard errors are robust and clustered by acquiring firms. The estimates in the models are statistically significant at the (*) 10 per cent, (**) five per cent, and (***) one per cent levels.

Table 5. Impact of foreign acquisitions by over-deviated firms on firm value

	Δ Tobin's q (1)	Δ Tobin's q (2)
Leverage deviation	-1.681**	
	(-2.44)	
Leverage deviation×	0.245	
foreign	(0.78)	
Over-deviated firms		-0.122
		(-1.54)
Over-deviated firms×		0.135*
foreign		(1.76)
Firm size	-0.167**	-0.150**
	(-2.31)	(-2.18)
ROA	0.589	0.479
	(1.57)	(1.32)
Liquidity	-0.031	-0.047
	(-0.65)	(-0.95)
Asset tangibility	-0.200	-0.037
	(-0.57)	(-0.11)
MTB	-0.449***	-0.467***
	(-9.80)	(-10.21)
Market leverage	1.689**	0.377
	(2.36)	(1.14)
Relative size	-0.012	-0.010
	(-0.89)	(-0.79)
Stock return	0.602***	0.609***
	(10.13)	(10.01)
Herfindhal index	0.153	0.139
	(0.89)	(0.83)
Industry liquidity	-0.454**	-0.472**
	(-2.33)	(-2.41)
RD expenses/sales	2.009	1.762
	(0.90)	(0.80)
Capital expenditure/sales	-1.903*	-2.003**
	(-1.92)	(-2.06)
Foreign acquisitions	0.030	-0.021
	(0.86)	(-0.65)
Year FE	Yes	Yes
Firm FE	Yes	Yes
N	5,369	5,369
R-square	0.428	0.423
Mean VIF	1.93	1.68

This table reports the coefficient estimates of fixed-effects OLS analyses. The dependent variable is Δ Tobin's q. Variable definitions are given in Appendix A. All continuous variables are winsorised at the one per cent level. T-statistics are reported in parenthesis. Standard errors are robust and clustered by acquiring firms. The estimates in the models are statistically significant at the (*) 10 per cent, (**) five per cent, and (***) one per cent levels.

Table 6. Impact of foreign acquisitions by over-deviated firms on operating performance

	Δ ROA (1)	Δ ROA (2)
Leverage deviation	-0.275***	
	(-3.96)	
Leverage deviation×	0.105**	
foreign	(2.19)	
Over-deviated firms		-0.020*
		(-1.88)
Over-deviated firms×		0.033***
foreign		(2.82)
Firm size	-0.054***	-0.052***
	(-7.66)	(-7.36)
Liquidity	-0.027***	-0.030***
	(-2.90)	(-3.14)
Asset tangibility	-0.084*	-0.065
	(-1.85)	(-1.44)
MTB	-0.003	-0.006
	(-0.66)	(-1.35)
Market leverage	0.354***	0.152***
	(5.10)	(3.76)
Relative size	0.002	0.002
	(1.19)	(1.31)
Stock return	0.026***	0.027***
	(3.08)	(3.29)
Herfindhal index	-0.008	-0.010
	(-0.53)	(-0.64)
Industry liquidity	0.006	0.003
	(0.32)	(0.16)
Foreign acquisitions	0.012**	-0.003
	(2.10)	(-0.65)
Year FE	Yes	Yes
Firm FE	Yes	Yes
N	5,399	5,399
R-square	0.138	0.130
Mean VIF	1.88	1.61

This table reports the coefficient estimates of fixed-effects OLS analyses. The dependent variable is Δ ROA. Variable definitions are given in Appendix A. All continuous variables are winsorised at the one per cent level. T-statistics are reported in parenthesis. Standard errors are robust and clustered by acquiring firms. The estimates in the models are statistically significant at the (*) 10 per cent, (**) five per cent, and (***) one per cent levels.

Appendix A: Definitions of variables

Variable	Definition
Asset tangibility	Net property, plant and equipment divided by total assets.
Δ cash holdings	(Cash and marketable securities divided by total assets one year after an acquisition) minus (cash and marketable securities divided by total assets one year before the effective year of an acquisition).
Δ ROA	ROA one year after an acquisition minus ROA one year before the effective year of an acquisition.
Δ Tobin's q	Tobin's q one year after an acquisition minus Tobin's q. one year before the effective year of an acquisition. Tobin's q equals (the market value of equity plus the book value of liabilities) divided by (the book value of equity plus the book value of liabilities).
Capital expenditure/sales	The ratio of capital expenditures over net sales.
Cash in an acquisition	Percentage of cash financing in an acquisition deal.
Cash flow/TA	Funds from operations divided by total assets.
During financial crisis	Takes a value of one for years 2008 and 2009 and zero otherwise.
Firm size	The natural logarithm of sales in 1980 pounds sterling.
Foreign acquisition	Takes a value of one if the firm makes a foreign acquisition and zero if it makes a domestic acquisition.
Foreign acquisitions value/ TA	The ratio of the sum of foreign acquisition values to the firm's total assets.
Herfindhal index	The sum of the squares of sales of a firm divided by the sum of sales of all firms sharing the same three-digit SIC.
Hostile dummy	Takes a value of one if the deal is a hostile acquisition and zero otherwise.
HP index	Hadlock and Pierce (2010) index equals -0.737(firm size) plus 0.043(firm size)^2 minus 0.040(firm age), where firm age is date of incorporation (WC18273), and is replaced with 37 if the actual age is greater (Liao, 2014).
HP-pre	HP index measured one year before the effective year of an acquisition.
HP-post	HP index measured one year after the effective year of an acquisition.
Industry liquidity	Total acquisition value for each year and three-digit SIC code scaled by total assets of all UK firms that share the same three-digit SIC and year.
Leverage deviation	Actual market leverage ratio minus target leverage ratio.
Leverage deviation× during crisis	Interaction between leverage deviation variable and during crisis dummy.
Leverage deviation× foreign	Interaction between leverage deviation variable and foreign acquisitions.
Leverage deviation× post crisis	Interaction between leverage deviation variable and post crisis dummy.
Liquidity	Current assets over current liabilities.

Market leverage	Total debt divided by the sum of total debt plus market value equity.
MTB	Market value over book value total assets.
Non-debt tax shields	Annual depreciation expenses over total assets.
Over-deviated firm	Takes a value of one if the firm has a positive leverage deviation and zero otherwise.
Over-deviated firm× during crisis	Interaction between an over-deviated firm variable and during crisis dummy.
Over-deviated firm× foreign	Interaction between an over-deviated firm variable and foreign acquisitions.
Over-deviated firm× post crisis	Interaction between an over-deviated firm variable and post crisis dummy.
Post financial crisis	Dummy variable that takes a value of one for years after 2009 and zero otherwise.
Relative size	Natural logarithm of the ratio of deal value to the acquirers' total assets prior to the announcement date.
RD expenses/sales	The ratio of R&D expenses over net sales.
ROA	Earnings before interest, taxes and depreciation divided by total assets.
Stock return	The compounded total stock returns one year prior to a firm's fiscal year end.
Target's firm size	The natural logarithm of sales in 1980 pounds sterling.
Target's market leverage	Total debt divided by the sum of total debt plus market value equity.
Target's MTB	Market value over book value total assets.
Target's ROA	Earnings before interest, taxes and depreciation divided by total assets
WW index	The Whited Wu (2006) index equals -0.091cash flows/total assets) minus 0.062(dividend dummy) plus 0.021(long-term debt/total assets) minus 0.044(firm size) plus 0.102(industry sales growth) minus 0.035(sales growth), where dividend dummy equals one if the firm pays a dividend and zero otherwise. Industry sales growth is the sales growth in the firm's three-digit SIC industry. Sales growth is (sales minus lagged sales) divided by lagged sales.
WW-pre	WW index measured one year before the effective year of an acquisition.
WW-post	WW index measured one year after the effective year of an acquisition.
Z-score	1.2(working capital/total assets) plus 1.4(retained earnings/total assets) plus 3.3(earnings before interest and taxes/total assets) plus 0.6(market value of equity/book value of total liabilities) plus 0.999(sales/total assets), estimated one year after the effective date of acquisition.

Appendix B: Target market leverage estimation model

	Market leverage
ROA	-0.176***
	(-16.48)
MTB	-0.027***
	(-21.38)
Firm size	0.016***
	(9.30)
Asset tangibility	0.155***
	(9.14)
Non-debt tax shield	-0.473***
	(-4.36)
Liquidity	-0.035***
	(-18.24)
Industry FE	Yes
Year FE	Yes
Observations	29,226

This table shows the coefficient estimates of a Tobit model used to predict target market leverage using UK data from 1980 to 2012. The value of predicted leverage is restricted between 0 and 1. The dependent variable market leverage equals [total debt/(total debt plus market value of equity]. Variable definitions are given in Appendix A. All continuous variables are winsorised at the one per cent level. T-statistics are reported in parenthesis. Standard errors are robust and clustered by firms. The estimates in the models are statistically significant at the (*) 10 per cent, (**) five per cent, and (***) one per cent levels.

Appendix C: Multinomial logit for the likelihood of foreign acquisitions.

	Foreign acquisitions vs. Domestic acquisitions		No- acquisitions vs. Domestic acquisitions	
	(1)	(2)	(3)	(4)
Leverage deviation	2.839***		1.186***	
	(5.59)		(2.85)	
Over-deviated firms		0.336***		0.282***
		(3.04)		(3.68)
Firm size	0.378***	0.338***	-0.123***	-0.133***
	(13.84)	(13.63)	(-5.24)	(-6.36)
ROA	0.218	0.386	-0.575***	-0.518***
	(0.77)	(1.31)	(-3.25)	(-2.97)
MTB	0.045*	0.072***	-0.039*	-0.033
	(1.77)	(2.83)	(-1.84)	(-1.51)
Market leverage	-3.557***	-1.849***	0.750*	1.199***
	(-7.08)	(-5.81)	(1.82)	(5.25)
Stock return	-0.040	-0.054	-0.304***	-0.307***
	(-0.68)	(-0.90)	(-6.80)	(-6.85)
Herfindhal index	0.222	0.209	0.566***	0.557***
	(1.07)	(1.02)	(3.49)	(3.43)
Industry liquidity	0.080	0.086	-0.671***	-0.667***
	(0.65)	(0.71)	(-5.81)	(-5.80)
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
N	25,424	25,424	25,424	25,424

This table reports the coefficient estimates of multinomial-logit analysis. The dependent variable has three categories: no-acquisitions, foreign acquisitions and domestic acquisitions. The dependent variable takes a value of one if the firm does not make an acquisition, a value of two if the firm makes a foreign acquisition and a value of three if the firm makes a domestic acquisition. The estimated coefficients in this table reports differences relative to baseline group of domestic acquirers. Column 1 and 2 report the coefficient estimates for foreign acquisitions relative to the baseline group. Column 3 and 4 report the coefficient estimates for non-acquiring firms relative to the baseline group. Variable definitions are given in Appendix A. All continuous variables are winsorised at the one per cent level. T-statistics are reported in parenthesis. Standard errors are robust and custered by firms. The estimates in the models are statistically significant at the (*) 10 per cent, (**) five per cent, and (***) one per cent levels.

Appendix D: The cash flow sensitivity of cash holdings

	Δ cash holdings (1)	Δ cash holdings (2)
Leverage deviation	-0.060***	
	(-2.94)	
Leverage deviation× foreign	-0.036**	
	(-2.19)	
Over-deviated firms		-0.004
		(-1.00)
Over-deviated firms× foreign		-0.008*
		(-1.77)
Firm size	0.002**	0.003***
	(2.04)	(3.72)
ROA	-0.044*	-0.046*
	(-1.84)	(-1.88)
Asset tangibility	0.038***	0.047***
	(5.31)	(7.23)
MTB	-0.000	-0.001
	(-0.03)	(-0.79)
Market leverage	0.145***	0.098***
	(6.82)	(6.57)
Relative size	-0.002**	-0.002**
	(-2.32)	(-2.19)
Stock return	0.005**	0.006**
	(1.97)	(2.12)
Herfindhal index	-0.008	-0.007
	(-1.28)	(-1.20)
Industry liquidity	0.003	0.003
	(0.40)	(0.38)
Cash flow/assets	0.055*	0.049
	(1.73)	(1.52)
Foreign acquisitions	0.001	0.004*
	(0.36)	(1.75)
Year FE	Yes	Yes
Firm FE	Yes	Yes
N	5,421	5,421
R-square	0.154	0.153

This table reports the coefficient estimates of fixed-effects OLS analyses. The dependent variable is changes in the ratio of cash holdings to total assets. Variable definitions are given in Appendix A. All continuous variables are winsorised at the one per cent level. T-statistics are reported in parenthesis. Standard errors are robust and clustered by acquiring firms. The estimates in the models are statistically significant at the (*) 10 per cent, (**) five per cent, and (***) one per cent levels.

Appendix E: Over-deviated firms and financial constraints around foreign acquisitions

Panel A:

Variables	HP-post	HP-pre	Difference (t-value)
Over-deviated firms ×foreign acquisitions	-9.324	-9.012	-0.312 (16.193)***
N	564	564	
	WW-post	WW-pre	
Over-deviated firms ×foreign acquisitions	-0.649	-0.620	-0.029 (7.255)***
N	521	521	

Panel B:

Variables	Other acquirers	Over-deviated firms× foreign acquisitions	Difference (t-value)
HP-post	-9.055	-9.324	0.269 (4.464)***
N	4,752	564	
WW-post	-0.629	-0.649	0.020 (4.365)***
N	4,579	537	

Panel A reports t-tests on the statistical significance of financial constraints indices of over-deviated firms for the year prior to and the year following foreign acquisitions. Panel B shows the t-values of the differences between over-deviated firms that undertake foreign acquisitions and other acquirers in their financial constraints indices one year after acquisitions. Difference in means are statistically significant at the (*) 10 per cent, (**) 5 per cent, and (***) one per cent levels. Pre (post)-foreign acquisitions is one year before (after) the effective year of foreign acquisitions. Other acquirers represent other acquiring firms with deviations from target leverage (specifically, quartiles 1 to 3). Over-deviated firms× foreign acquisitions measures the effect of over-deviated firms' involvement in foreign acquisitions. Variable definitions are given in Appendix A. All continuous variables are winsorised at the one per cent level.

Appendix F: Drivers and outcomes of foreign acquisitions by over-deviated firms using propensity score matching method

	Δ cash holdings	Z-score	Δ Tobin's q	Δ ROA
	(1)	(2)	(3)	(4)
Over-deviated firms	-0.003	0.034	-0.159***	-0.026**
	(-0.66)	(0.19)	(-2.85)	(-2.37)
Over-deviated firms×	-0.010**	0.377**	0.167***	0.039***
Foreign	(-2.28)	(1.96)	(2.81)	(3.38)
Firm size	0.003***	-0.220***	-0.235***	-0.039***
	(2.59)	(-3.49)	(-7.99)	(-5.43)
ROA	0.007	2.025***	0.634***	
	(0.44)	(4.24)	(3.85)	
MTB	-0.002*	0.308***	-0.505***	-0.009*
	(-1.68)	(8.06)	(-38.95)	(-1.86)
Market leverage	0.113***	-2.135***	0.429**	0.142***
	(6.72)	(-3.31)	(2.01)	(3.26)
Stock return	0.007**	0.977***	0.612***	0.026***
	(2.30)	(10.75)	(20.93)	(2.60)
Herfindhal index	-0.011*	0.481*	0.169*	-0.009
	(-1.73)	(1.83)	(1.92)	(-0.65)
Industry liquidity	0.001	-0.429	-0.410***	-0.004
	(0.10)	(-1.49)	(-4.57)	(-0.20)
Relative size	-0.002***	-0.033	-0.003	0.001
	(-2.87)	(-1.05)	(-0.29)	(0.46)
Asset tangibility	0.045***	0.829*	0.115	-0.059
	(5.54)	(1.68)	(0.57)	(-1.33)
Foreign acquisitions	0.005**	0.092	-0.022	-0.002
	(1.98)	(0.91)	(-0.71)	(-0.54)
Liquidity		-0.062	-0.029	-0.026**
		(-0.84)	(-1.06)	(-2.36)
RD expenses/sales			0.498	
			(0.53)	
Capital expenditure/			-0.953***	
Sales			(-2.70)	
Cash in an acquisition	-0.0001**			
	(-2.47)			
Year FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
N	4,355	4,232	4,314	4,338

This table estimates in column (1) a fixed-effects OLS analysis with a dependent variable that measures the changes in the ratio of cash holdings to total assets. Columns (2) estimates a fixed-effects OLS analysis using Altman-Z score one year after the effective year of acquisition. Column (3) estimates a fixed-effects OLS analysis using Δ Tobin's q. Columns (4) estimates a fixed-effects OLS analysis using Δ ROA. Variable definitions are given in Appendix A. All continuous variables are winsorised at the one per cent level. T-statistics are reported in parenthesis. Standard errors are robust and clustered by firms. The estimates in the models are statistically significant at the (*) 10 per cent, (**) five per cent, and (***) one per cent levels.

Appendix G: New over-deviated firm proxy

	Foreign acquisition (1)	Δ cash holdings (2)	Z-score (3)	Δ Tobin's q (4)	Δ ROA (5)
Over-deviated firms	0.213***	-0.009*	-0.253	-0.142	-0.034***
	(2.79)	(-1.93)	(-1.06)	(-1.60)	(-2.91)
Over-deviated firms×		-0.009*	0.384*	0.151*	0.036***
foreign		(-1.94)	(1.68)	(1.74)	(2.88)
Firm size	0.267***	0.003***	-0.345*	-0.151**	-0.053***
	(14.51)	(3.88)	(-1.79)	(-2.20)	(-7.46)
ROA	-0.256	-0.016	1.327*	0.486	
	(-1.30)	(-1.25)	(1.92)	(1.34)	
MTB	0.077***	-0.001	0.210**	-0.466***	-0.005
	(3.99)	(-0.61)	(2.38)	(-10.24)	(-1.28)
Market leverage	-1.308***	0.105***	-1.276*	0.413	0.185***
	(-4.51)	(7.14)	(-1.83)	(1.22)	(4.50)
Stock return	-0.099**	0.006**	0.847***	0.609***	0.027***
	(-2.25)	(2.18)	(4.25)	(9.98)	(3.24)
Herfindhal index	0.006	-0.007	0.326	0.135	-0.010
	(0.05)	(-1.20)	(0.81)	(0.80)	(-0.67)
Industry liquidity	0.122	0.003	-0.545	-0.471**	0.003
	(0.88)	(0.32)	(-1.57)	(-2.40)	(0.19)
Relative size		-0.002**	-0.005	-0.011	0.002
		(-2.42)	(-0.20)	(-0.80)	(1.27)
Asset tangibility		0.048***	0.013	-0.051	-0.070
		(7.44)	(0.02)	(-0.16)	(-1.56)
Foreign acquisitions		0.004**	0.054	-0.018	-0.002
		(1.97)	(0.64)	(-0.56)	(-0.48)
Liquidity			-0.296	-0.046	-0.029***
			(-1.25)	(-0.94)	(-3.09)
RD expenses/sales				1.767	
				(0.80)	
Capital expenditure/sales				-2.002**	
				(-2.06)	
Cash in an acquisition		-0.0001			
		(-1.57)			
Year FE	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	No	No	No	No
Random effect	Yes	No	No	No	No
Firm FE	No	Yes	Yes	Yes	Yes
N	5,746	5,421	5,279	5,369	5,399

This table reports the coefficient estimates of the relationship between over-deviated firms and foreign acquisitions. Column (1) estimates a random-effects Probit analysis with a dependent variable that takes the value one if the firm makes a foreign acquisition and zero otherwise. Column (2) estimates a fixed-effects OLS analysis with a dependent variable that measures the

changes in the ratio of cash holdings to total assets. Column (3) estimates a fixed-effects OLS analysis using Altman-Z score one year after the effective year of acquisition. Columns (4) and (5) estimates a fixed-effects OLS analysis using Δ Tobin's q and Δ ROA, respectively. Variable definitions are given in Appendix A. All continuous variables are winsorised at the one per cent level. T-statistics are reported in parenthesis. Standard errors are robust and clustered by firms. The estimates in the models are statistically significant at the (*) 10 per cent, (**) five per cent, and (***) one per cent levels.

Appendix H: Effect of financial crisis on the relationship between over-deviated firms' cash-holdings and foreign acquisitions

	Δ cash holdings (1)	Δ cash holdings (2)
Leverage deviation	-0.057***	
	(-2.93)	
Leverage deviation×	-0.033**	
foreign	(-1.96)	
Over-deviated firms		-0.004
		(-0.98)
Over-deviated firms×		-0.008*
foreign		(-1.76)
Firm size	0.002**	0.004***
	(2.56)	(4.09)
ROA	-0.007	-0.013
	(-0.54)	(-1.00)
Asset tangibility	0.038***	0.046***
	(5.54)	(7.24)
MTB	-0.001	-0.002
	(-0.88)	(-1.62)
Market leverage	0.137***	0.094***
	(6.78)	(6.22)
Relative size	-0.002**	-0.002**
	(-2.31)	(-2.20)
Stock return	0.005**	0.006**
	(2.00)	(2.23)
Cash in an acquisition	-0.000*	-0.000*
	(-1.71)	(-1.66)
Herfindhal index	-0.004	-0.004
	(-0.74)	(-0.66)
Industry liquidity	-0.003	-0.003
	(-0.37)	(-0.40)
Foreign acquisitions	0.000	0.003
	(0.12)	(1.45)
Leverage deviation×	-0.048*	
during crisis	(-1.71)	
Leverage deviation×	0.011	
post crisis	(0.31)	
Over-deviated firms×		-0.010
during crisis		(-0.87)
Over-deviated firms×		0.006
post crisis		(0.67)
During financial crisis	0.014**	0.017***
	(2.53)	(2.61)
Post financial crisis	0.002	0.001
	(0.32)	(0.09)
Firm FE	Yes	Yes
N	5,421	5,421

This table reports the coefficient estimates of fixed-effects OLS analyses. The dependent variable is changes in the ratio of cash holdings to total assets. Variable definitions are given in Appendix A. All continuous variables are winsorised at the one per cent level. T-statistics are reported in parenthesis. Standard errors are robust and clustered by acquiring firms. The estimates in the models are statistically significant at the (*) 10 per cent, (**) five per cent, and (***) one per cent levels.

Appendix I: Over-deviated firms and the likelihood of foreign acquisitions using new target estimation

	Foreign acquisition (1)	Foreign acquisition (2)	Sum foreign acquisition/ TA (3)	Sum foreign acquisition/ TA (4)
Leverage deviation	3.385***		1.278***	
	(6.23)		(6.88)	
Over-deviated firms		0.204**		0.059*
		(2.52)		(1.87)
Firm size	0.295***	0.246***	0.061***	0.041***
	(13.43)	(11.80)	(6.38)	(4.35)
ROA	-0.347	-0.138	-0.186**	-0.110
	(-1.64)	(-0.64)	(-2.17)	(-1.29)
MTB	0.037	0.081***	0.057***	0.072***
	(1.57)	(3.91)	(7.29)	(9.62)
Market leverage	-3.708***	-1.266***	-1.405***	-0.439***
	(-6.99)	(-3.94)	(-7.36)	(-3.42)
Stock return	-0.075	-0.108**	-0.013	-0.025
	(-1.61)	(-2.34)	(-0.68)	(-1.30)
Herfindhal index	0.135	0.097	-0.011	-0.026
	(1.06)	(0.74)	(-0.20)	(-0.48)
Industry liquidity	0.056	0.071	0.550***	0.562***
	(0.36)	(0.45)	(9.22)	(9.38)
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Random effect	Yes	Yes	Yes	Yes
N	4,578	4,578	4,578	4,578

This table reports the coefficient estimates of random-effects Probit analysis (Columns 1 and 2) and random-effects Tobit analysis (Columns 3 and 4). The dependent variable in the Probit models takes a value of one if the firm makes a foreign acquisition and zero otherwise. The Tobit analysis estimates the ratio of the sum of foreign acquisition values to the firm's total assets. Variable definitions are given in Appendix A. All continuous variables are winsorised at the one per cent level. T-statistics are reported in parenthesis. Standard errors are robust and clustered by firm for Probit models and bootstrapped for Tobit models. Estimates in the models are statistically significant at the (*) 10 per cent, (**) five per cent, and (***) one per cent levels.

Appendix J: Over-deviated firms and the likelihood of foreign acquisitions after controlling for public target characteristics

	Foreign acquisition (1)	Foreign acquisition (2)	Sum foreign acquisition/ TA (3)	Sum foreign acquisition/ TA (4)
Leverage deviation	3.253**		1.813**	
	(2.50)		(2.50)	
Over-deviated firms		0.403*		0.264*
		(1.65)		(1.86)
Firm size	0.332***	0.277***	0.062	0.036
	(4.28)	(3.91)	(1.43)	(0.89)
ROA	-1.395	-1.135	-1.061**	-0.954*
	(-1.64)	(-1.37)	(-2.16)	(-1.96)
MTB	0.075	0.112**	0.089***	0.108***
	(1.37)	(2.22)	(3.05)	(3.93)
Market leverage	-3.821***	-2.076**	-1.836**	-0.982
	(-2.77)	(-2.00)	(-2.37)	(-1.60)
Stock return	0.184	0.129	0.178	0.152
	(0.91)	(0.65)	(1.53)	(1.31)
Herfindhal index	0.286	0.330	0.207	0.238
	(0.69)	(0.80)	(0.85)	(0.96)
Industry liquidity	-0.774*	-0.776*	-0.138	-0.174
	(-1.68)	(-1.72)	(-0.55)	(-0.70)
Target's firm size	0.166**	0.167***	0.141***	0.146***
	(2.54)	(2.60)	(4.11)	(4.25)
Target's market leverage	-0.262	-0.435	-0.350	-0.451
	(-0.44)	(-0.73)	(-1.01)	(-1.30)
Target's ROA	-0.444	-0.505	0.027	-0.016
	(-1.36)	(-1.58)	(0.14)	(-0.08)
Target's MTB	-0.024	-0.022	0.020	0.021
	(-0.29)	(-0.26)	(0.44)	(0.46)
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
N	304	304	304	304

This table reports the coefficient estimates of random-effects Probit analysis (Columns 1 and 2) and random-effects Tobit analysis (Columns 3 and 4). The dependent variable in the Probit models takes the value one if the firm makes a foreign acquisition and zero otherwise. The Tobit analysis estimates the ratio of the sum of the foreign acquisitions value to the firm's total assets. Variable definitions are given in Appendix A. All continuous variables are winsorised at the 1 per cent level. T-statistics are reported in parenthesis. Standard errors are robust and clustered by firm for the Probit models and bootstrapped for the Tobit models. The estimates in the models are statistically significant at the (*) 10 per cent, (**) five per cent, and (***) one per cent levels.